Invention disclosure submission

Complete all sections and send to the Nortel Patent Dept at
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NORTEL
NORTHERN TELECOM

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Invention Title
Mapping in an SDH LAN

Correspondence will be directed to the first-named inventor only.

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For more inventors, use page 4 and check this box ☐

(2) Name of supervisor or divisional head **Jim Shields**	(6) Which LOB funded this invention? **Broadband Networks**
Name of AVP Reported to: **Peter Schuddeboom**	
Signature Date	If Core Technology, please indicate which group. Please Make a Selection

Technical field

(3) Date and details of first use or first public disclosure (past or future). None	Key words for searching SDH, SONET, Data, Ethernet, Frame Switching

(4) Which products will use this invention? Satum and TN1C	(7) Is the invention relevant to a Standards activity? yes
	If so give details: The methods of concatenation and mapping that are proposed could probably be introduced into ETSI and ITU-T
(5) Does this invention arise from any arrangement involving any external organization? no Organization Contract no.	(8) Internal Project nos. under which this invention was funded 7539

TECHNICAL INFORMATION   page 2

(a) Brief description of the invention

This disclosure describes a method for mapping ethernet frames into virtually concatenated, virtual containers in a Synchronous

This process enables a virtual ethernet Local Area Network (LAN) to be constructed across a Wide Area Network (WAN).

(b) What is the problem solved by the invention?

As the amount of data traffic in the public telecommunications network rises to, and beyond the levels of conventional teleophony traffic, the optimisation of the network needs to change accordingly. The current main areas of demand for data traffic are between Internet Service Providers (ISP), in the collector networks used to service Small to Medium sized Enterprises (SME), and for collecting data at the Customers Premises Equipment (CPE). A further area of application for this type of data network is to provide infra-structure support for residential broadband access technologies.

(c) What other solutions have been tried and why didn't they work?

Current WANs have provision to lease lines across the WAN to carry data. This is fine for small numbers of data connections, but as the number of users increases N, then the number of leased lines increases by the Sum of (x-1) for x=1 to N. The emerging Broadband ISDN proposes the encapsulation of Internet Protocol (IP) data over Asynchronous Transfer Mode (ATM) cells. This method requires very expensive switching in the WAN, is complex, and wastes a significant proportion of bandwidth on overheads, thus having the effect of slowing down the transmission paths. A method of routing the data at its higher layers would be possible, but

(d) What are the specific elements or steps that solved the problem and how do they do it?

In this scheme, the virtual containers used for higher rate data routes are virtually concatenated VC3s, and for access rates, virtually concatenated VC12s are used. So for example, 10Mbit/s of ethernet frames would be mapped into 5 x VC12 and 100Mbit/s would be mapped into 2 x VC3.

On transmission, whole frames are mapped between alternate VCs on a byte by byte basis. Starting with a label to mark the order of the virtually concatenated VCs, the followed by ethernet frames in a media independent interface (MII) format. The VCs are then completed with a series of pointers at the end of the frame to indicate the start position and length of the mapped frames.

The differential delay between VCs around an SDH will need to be managed between bounds that will be dictated by the implementation of the memory arrangement at the receiving end of the transmission path.

(e) What is the commercial value of the invention to Nortel and Nortel's major competitors? (see guidelines)

This invention addresses Inter ISP data communications. It also covers data provision to SMEs. With small investment, this invention can have a fast time to market, and will address an extremely large market opportunity.

Nortel 36/9609   For further instructions on disclosing your invention, see "INVENTION DISCLOSURE SUBMISSION GUIDELINES"

No. 0889

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